

Fig. 6. A) Raman spectrum of SWNT after being fluorinated and then methylated. B) Raman spectrum of the pyrolyzed methylated. SWNT which looks exactly like the Raman spectrum of untreated SWNT.

Fig. 7. EI mass spectrum of products given off during the pyrolysis of methylated SWNT. This spectrum corresponds to a probe temperature of  $\sim 400^{\circ}\text{C}$ .

Fig. 8. A) Infrared spectrum of the product of a 3 hour methylation reaction B) Infrared spectrum. of the product of a 12 hour methylation reaction.

Fig. 9 shows a SEM image of purified SWNTs.

Fig. 10A shows an AFM image of fluorotubes which have been dissolved in 2-butanol and dispersed on mica.

Fig. 10B shows a typical height analysis of the scan in Figure 2A, revealing the tube diameters to be on the order of 1.2-1.4 nm, values on the order of those determined previously for this product using TEM and XRD.

Fig. 11 shows a UV spectrum of fluorotubes solvated in 2-propanol after sonication times of A) 10 min. B) 40 min. and C) 130 min.

Fig. 12A shows an AFM image of fluorotubes after having been defluorinated with  $\text{N}_2\text{H}_4$ , filtered, resuspended in DMF and dispersed on mica.

Fig. 12B shows an AFM image of untreated SWNTs dispersed on mica.

Fig. 13A shows a Raman spectrum of pure, untreated SWNTs.

Fig. 13B shows a Raman spectrum of fluorotubes.

Fig. 13C shows a Raman spectrum of fluorotubes after having been defluorinated with  $\text{N}_2\text{H}_4$ . \* denotes Ar plasma line.

Fig. 14 is a schematic representation of a portion of an homogeneous SWNT molecular array according to the present invention.

Fig. 15 is a schematic representation of an heterogeneous SWNT molecular array according to the present invention.

Fig. 16 is a schematic representation of the growth chamber of the fiber apparatus according to the present invention.

Fig. 17 is a schematic representation of the pressure equalization and collection zone of the fiber apparatus according to the present invention.

Fig. 18 is a composite array according to the present invention.

Fig. 19 is a composite array according to the present invention.